National Cancer Institute

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

National Institutes of Health

Can We Talk?

Communication Effectiveness in Cancer Control Research Teams

Bradford W. Hesse, PhD

Communication Science

Communication Science

Three Themes

- Communicating within teams
- Communication within the broader community of science
- Communicating to the public

Communicating within teams

Communicating within teams*

Facilitating Factors	Constraining Factors
• Social cohesiveness and familiarity • Regular communication to provide feedback and build collaborative goals • Cyber-infrastructure to promote remote collaboration • Regular face-to-face meetings to build trust	• Groupthink and social loafing (rigid familiarity) • Too much communication invades privacy, interferes with productivity • “Spamming,” “Flaming,” inappropriate, unnecessary use of technology • Non-collaborative attitudes, inability to share meaning

* Stokols D, Misra S, Moser RP, Hall KL, Taylor BK. The ecology of team science: understanding contextual influences on transdisciplinary collaboration. Am J Prev Med 2008;35(2 Suppl):S96-115.

Communicating within teams

Training and education for NCI science*

* Nash JM. Transdisciplinary training: key components and prerequisites for success. Am J Prev Med 2008;35(2 Suppl):S133-40.

Communicating within teams

Training and education for NCI science*

- Promote a culture of learning; emphasize continuous learning of language / assumptions across disciplines

* Nash JM. Transdisciplinary training: key components and prerequisites for success. Am J Prev Med 2008;35(2 Suppl):S133-40.

Communicating within teams

Training and education for NCI science*

- Promote a culture of learning; emphasize continuous learning of language / assumptions across disciplines
- Offer hands-on opportunities for operating within team science environment

* Nash JM. Transdisciplinary training: key components and prerequisites for success. Am J Prev Med 2008;35(2 Suppl):S133-40.

Communicating within teams

Training and education for NCI science*

- Promote a culture of learning; emphasize continuous learning of language / assumptions across disciplines
- Offer hands-on opportunities for operating within team science environment
- Use mentors as role models for integrative thinking and collaborative attitudes

* Nash JM. Transdisciplinary training: key components and prerequisites for success. Am J Prev Med 2008;35(2 Suppl):S133-40.

Communicating within teams

Training and education for NCI science*

- Promote a culture of learning; emphasize continuous learning of language / assumptions across disciplines
- Offer hands-on opportunities for operating within team science environment
- Use mentors as role models for integrative thinking and collaborative attitudes
- Align goals of individual projects with strategic thinking for cancer control as emphasized by NCI community

* Nash JM. Transdisciplinary training: key components and prerequisites for success. Am J Prev Med 2008;35(2 Suppl):S133-40.

Three Themes

- [x] Communicating within teams
- [ ] Communicating within the broader community of science
- [ ] Communicating to the public

Communicating within the broader community of science

Communicating within the broader community of science

Science 7 March 2008:
Vol. 319. no. 5868, pp. 1349 – 1350
DOI: 10.1126/science.1153539

PERSPECTIVES

COMPUTER SCIENCE:

Science 2.0

Ben Shneiderman

Traditional scientific methods need to be expanded to deal with complex issues that arise as social systems meet technological innovation.

Communicating within the broader community of science

Science 7 March 2008:
Vol. 319. no. 5868, pp. 1349 – 1350
DOI: 10.1126/science.1153539

PERSPECTIVES

COMPUTER SCIENCE:
Science 2.0

Ben Shneiderman

Traditional scientific methods need to be expanded to deal with complex issues that arise as social systems meet technological innovation.

- Architectures for Participation

Communicating within the broader community of science

Science 7 March 2008:
Vol. 319. no. 5868, pp. 1349 – 1350
DOI: 10.1126/science.1153539

PERSPECTIVES

COMPUTER SCIENCE:
Science 2.0

Ben Shneiderman

Traditional scientific methods need to be expanded to deal with complex issues that arise as social systems meet technological innovation.

- Architectures for Participation
- Data as the new “Intel Inside”

Communicating within the broader community of science

Science 7 March 2008:
Vol. 319. no. 5868, pp. 1349 – 1350
DOI: 10.1126/science.1153539

PERSPECTIVES

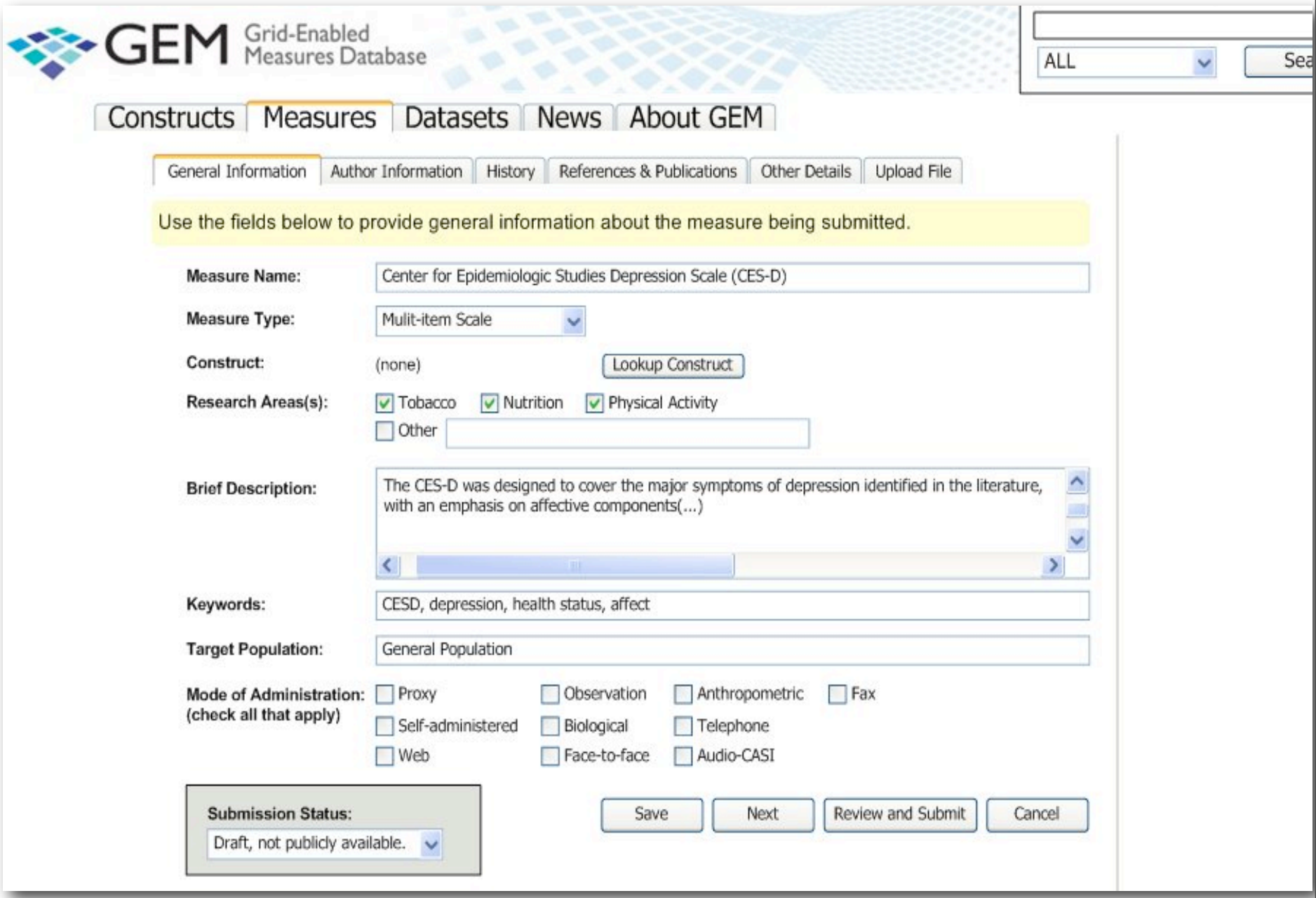
COMPUTER SCIENCE:
Science 2.0

Ben Shneiderman

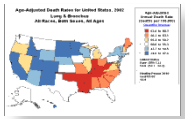
Traditional scientific methods need to be expanded to deal with complex issues that arise as social systems meet technological innovation.

- Architectures for Participation
- Data as the new “Intel Inside”
- Enabling Collective Intelligence

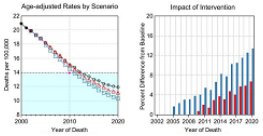
Architecture for Participation



Data as new "Intel Inside"



State Cancer Profiles



CISNet Decision Aids

Data Widgets

Application layer (e.g., Enhanced State Cancer Profiles; Dashboards, CDC Data Widgets)

GRID Middle Ware (Globus toolkit, XMi, security layer, discovery mechanisms)

Common Vocabularies: Shared ontologies, common data elements.

PopSciGrid

caBIG® GRID

GEM Grid-Enabled Measures Database

DATA SOURCES

Public Surveillance
- NHIS
- BRFSS
- HINTS
- Tax data

Grantees
- CECCRS
- TREC
- TTURCS
- CPHHD
- GEI

Health System
- CRN
- QCCC projects
- PopSci SIG
- Registries (SEER)

Mobile/Remote Sensing
- Behavioral data
- Environmental data
- GIS
- RTDC

Collective Intelligence

Distilling meaning from data

Buried in vast streams of data are clues to new science. But we may need to craft new lenses to see them, explain Felice Frankel and Rosalind Reid.

It is a breathtaking time in science as masses of data pour in, promising new insights. But how can we find meaning in these terabytes? To search successfully for new science in large datasets, we must find unexpected patterns and interpret evidence in ways that frame new questions and suggest further explorations. Old habits of representing data can fail to meet these challenges, preventing us from reaching beyond the familiar questions and answers.

To extract new meaning from the sea of data, scientists have begun to embrace the tools of visualization. Yet few appreciate that visual representation is also a form of communication. A rich body of communication expertise holds the potential to greatly improve these tools. We propose that graphic artists, communicators and visualization scientists should be brought into conversation with theorists and experimenters before all the data have been gathered. If we design experiments in ways that offer varied opportunities for representing and communicating data, techniques for extracting new understanding can be made available.

D. ARMENDARIZ

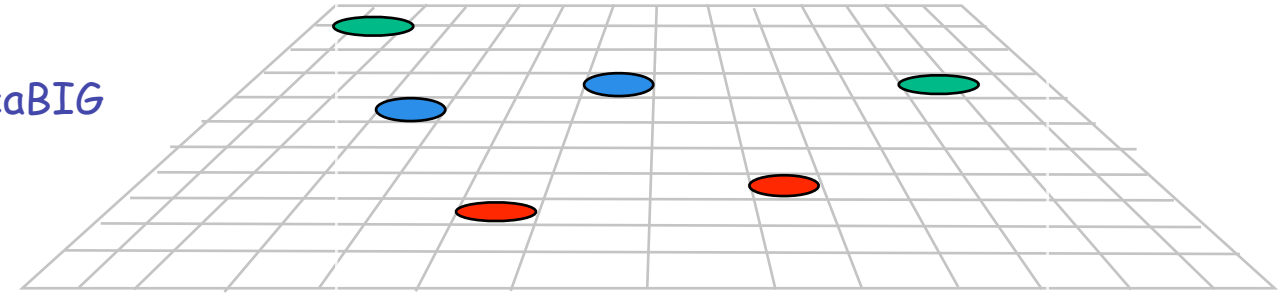
Discussing visual communication before designing experiments may reveal new science.

they will create effective computer displays, slides and figures for publication. Meanwhile, they may be developing their tools in isolation, kept at arm's length by scientists who are busy getting their experiments done. Opportunities for useful dialogue are thus squandered.

When scientists, graphic artists, writers, animators and other designers come together to discuss problems in the visual representation of science, such as at the Image and Meaning workshops run by Harvard University (www.imageandmeaning.org), it becomes clear those run by the US National Science Foundation's Picturing to Learn project (www.picturingtolearn.org), teach us that attempting to visually communicate scientific data and concepts opens a path to understanding. When science and design students collaborate, their drive to understand one another's ideas pushes them to create new ways of seeing science. Investment in visual communication training for young scientists will pay off handsomely for any data-intensive discipline.

The ingrained habits of highly trained scientists make them rarely as adventurous as these young minds. We think we are on the path to insight when shading reveals contours in 3D renderings, or when bursts of red appear on heat maps, for example. But the algorithms used to produce the graphics may create illusions or embed assumptions. The human visual system creates in the brain an apparent understanding of what a picture represents, not necessarily a picture of the underlying science. Unless we know all the steps from hypothesis to understanding — by conversing with theorists, experimentalists, instrument and software developers, visualization

caBIG



Collective Intelligence

Distilling meaning from data

Buried in vast streams of data are clues to new science. But we may need to craft new lenses to see them, explain **Felice Frankel** and **Rosalind Reid**.

It is a breathtaking time in science as masses of data pour in, promising new insights. But how can we find meaning in these terabytes? To search successfully for new science in large datasets, we must find unexpected patterns and interpret evidence in ways that frame new questions and suggest further explorations. Old habits of representing data can fail to meet these challenges, preventing us from reaching beyond the familiar questions and answers.

To extract new meaning from the sea of data, scientists have begun to embrace the tools of visualization. Yet few appreciate that visual representation is also a form of communication. A rich body of communication expertise holds the potential to greatly improve these tools. We propose that graphic artists, communicators and visualization scientists should be brought into conversation with theorists and experimenters before all the data have been gathered. If we design experiments in ways that offer varied opportunities for representing and communicating data, techniques for extracting new understanding can be made available.

they will create effective computer displays, slides and figures for publication. Meanwhile, they may be developing their tools in isolation, kept at arm's length by scientists who are busy getting their experiments done. Opportunities for useful dialogue are thus squandered.

When scientists, graphic artists, writers, animators and other designers come together to discuss problems in the visual representation of science, such as at the Image and Meaning workshops run by Harvard University (www.imageandmeaning.org), it becomes clear those run by the US National Science Foundation's Picturing to Learn project (www.picturingtolearn.org), teach us that attempting to visually communicate scientific data and concepts opens a path to understanding. When science and design students collaborate, their drive to understand one another's ideas pushes them to create new ways of seeing science. Investment in visual communication training for young scientists will pay off handsomely for any data-intensive discipline.

The ingrained habits of highly trained scientists make them rarely as adventurous as these young minds. We think we are on the path to insight when shading reveals contours in 3D renderings, or when bursts of red appear on heat maps, for example. But the algorithms used to produce the graphics may create illusions or embed assumptions. The human visual system creates in the brain an apparent understanding of what a picture represents, not necessarily a picture of the underlying science. Unless we know all the steps from hypothesis to understand- — by conversing with orists, experimentalists, rument and software elopers, visualization

Discussing visual communication before designing experiments ma

D. ARMENDARIZ

Public Health

Practitioners

State Planners

Results Users

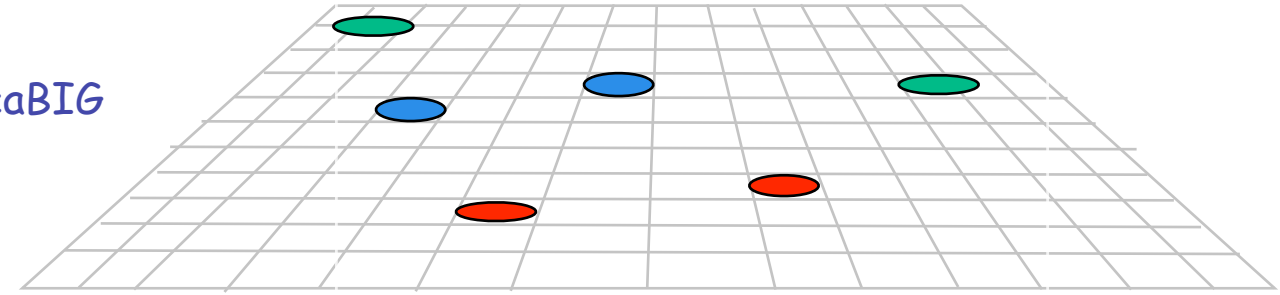
Population Scientists

Data Users

Policy Makers

The Public

caBIG



Science 2.0: Standing Up to Cancer

OPEN HEALTH

MAP OF DISRUPTIVE INNOVATION

The Institute for the Future's Health Horizons Program has developed a new paradigm for disruptive innovation in the global health economy—we call it "Open Health." This paradigm leverages the concepts and successes of open innovation and open-source software, and applies them to the world of health. Open Health strategies will redefine the research and development process and will require a radically new way of thinking about innovation systems, the institutional culture of firms, partnerships, and collaborations, and the very meaning of health itself. The implications of Open Health are relevant to all stakeholders in the global health economy, be they beauty, food, consumer electronics, biopharma, health care, or medical technology companies. As it diffuses across industries, Open Health will inspire new approaches to meeting significant global health problems, and it will provide a framework for generating and sustaining new business models of tomorrow.

We have identified ten core principles that serve as a foundation for implementing Open Health strategies. This map presents these principles in the context of emerging trends and innovation leaders. It describes the external forces that are driving Open Health and emphasizes the networks and culture, the ethos and skills, the business models and strategies, and the tools and platforms that will shape innovation systems in the global health economy over the next decade.

The *Open Health Map of Disruptive Innovation* (SR-1117A) is your guide to putting Open Health into practice. Use it, along with its companion piece, the *Open Health Toolkit: A Framework for Innovation* (SR-1117B), to build the capacity to innovate to solve health's pressing problems.

HEALTH HORIZONS PROGRAM
www.iftf.org
124 University Avenue, 2nd Floor
Palo Alto, CA 94301
650.854.6322

INSTITUTE FOR THE FUTURE

Linux Meets Lipitor

—Steve Weber, Professor, UC Berkeley

- Collaborative Drug Discovery
- Institute for OneWorld Health
- National Cancer Institute's caBIG

Science 2.0: Standing Up to Cancer

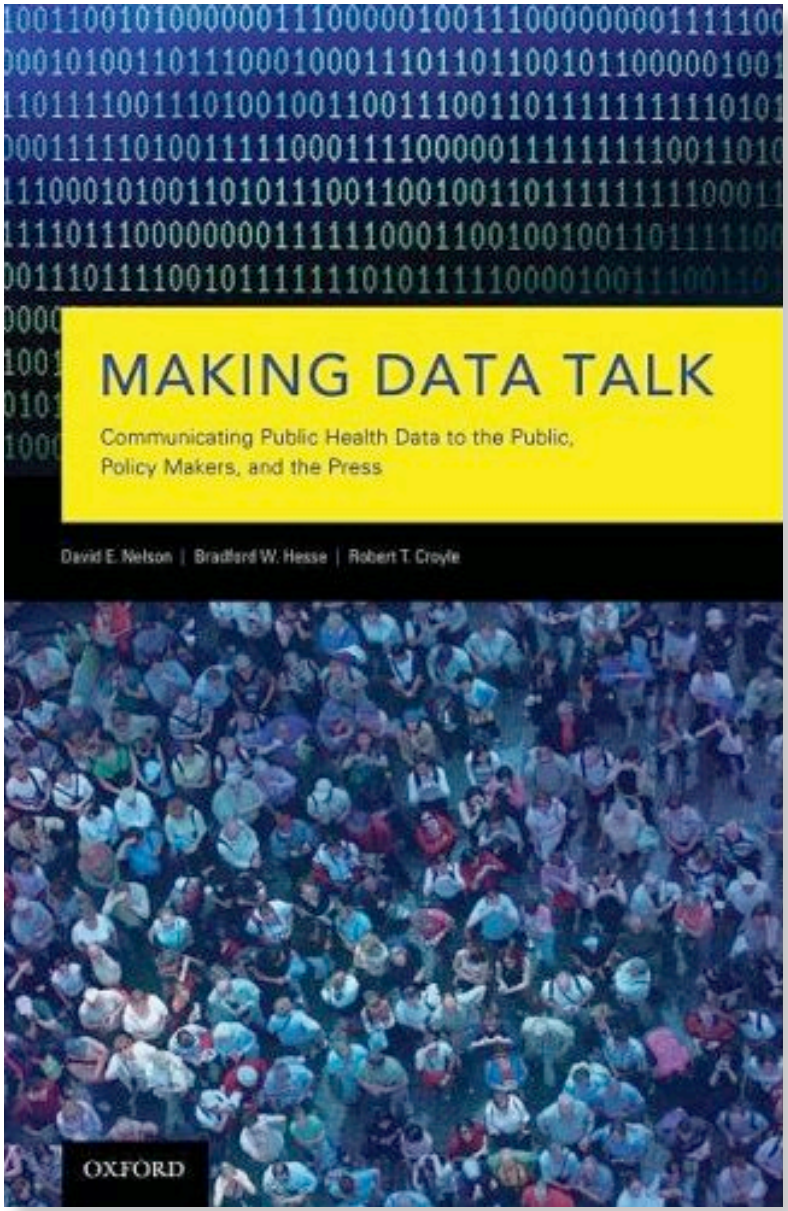
- Encourage ***solution finders***, not just problem solvers
- Embrace a ***not invented here*** mindset
- Redefine innovation ***beyond just the new***
- Cultivate ***transparency***
- ***Cooperate*** to compete

Three Themes

- [x] Communicating within teams
- [x] Communicating within the broader community of science
- [ ] Communicating to the public

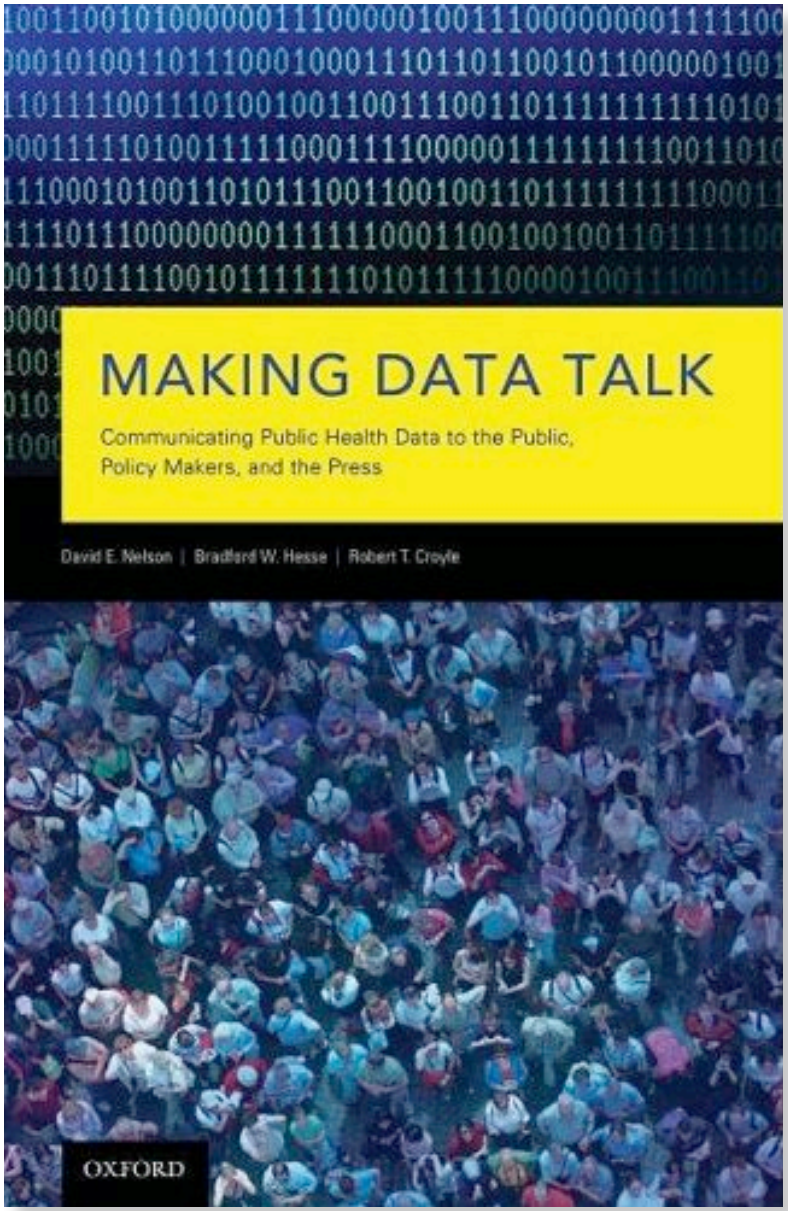
Communicating to the public

Communicating to the public



"One thing I'll say for us, Meyer—we never stooped to popularizing science."

Communicating to the public



OPT-IN

Organize

Plan

Test

INtegrate

FRAMING SCIENCE

STRATEGISTS <----> JOURNALISTS <----> PUBLICS

Posted by Matthew C. Nisbet at 8:12 AM • 0 Comments • View blog reactions

Why is effective communication important?

Why is effective communication important?

Andy Groves
CEO of Intel

"It's like a Greek tragedy; everyone doing their part but the whole just doesn't add up."

Why is effective communication important?

Why does it matter how health and science issues are reported?... It matters because misleading information is potentially dangerous: It can even cost lives.

The Royal Institution of Great Britain. *Guidelines on Science and Health Communication*[1]

From our team to yours,

Thank you!